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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/045,499	01/14/2002	Ramachandra Divakaruni	FIS-00-0023DIV	3282

28211 7590 09/23/2003

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EXAMINER

TRINH, MICHAEL MANH

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 09/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Ans

Office Action Summary

Application No.

10/045,499

Applicant(s)

DIVAKARUNI ET AL.

Examiner

Michael Trinh

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 8-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 8-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

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DETAILED ACTION

*** This office action is in response to Applicant's amendment filed on July 09, 2003. Claims were canceled. Claims are currently pending.

*** The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Duplication

*** Applicant is advised that new claims 21-27 are *identically* duplicated of claims 8-14, respectively. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other under 37 CFR 1.75 as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k). One of the claims should be amended or cancelled to avoid the duplication.

Claim Rejections - 35 USC § 102

1. Claims 8-11,13-18,20,21-24,26-27 are rejected under 35 U.S.C. 102(e) as being anticipated by Noble, Jr (6,090,660).

Noble teaches a method for forming a dynamic random access memory structure comprising at least the steps of: forming a trench within a substrate; filling the trench with a trench conductor 16 (Figs 2-3; col 3, line 56 through col 4); forming a pad oxide layer 18 along a surface of the substrate adjacent the trench; forming a collar 14 along an upper portion of the trench such that the collar insulates the substrate from the trench conductor 16; forming an isolation region 12 adjacent the trench conductor; recessing the collar and the pad oxide (Fig 3; col 4, lines 10-24); depositing a lip strap 52 comprising a conductor over the trench conductor 16 and in recesses produced by the recessing (Figs 3-4; col 4, 25-46); and forming an isolation region 12 adjacent the lip strap and adjacent the trench conductor 16. Re claims 9 and 16, wherein a control device 20 is formed adjacent the trench, wherein the trench has a corner adjacent the control device, and the lip strap 52 (fig 4) comprises a conductor surrounding the corner. Re claims 10 and 17, wherein a control device conductive region 56 (Fig 4) is formed adjacent the trench, and the lip strap 52 comprises a conductor formed along a side of the trench

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and thus along a portion of the conductive region 56 at the top corner of the trench. Re claims 11 and 18, wherein a collar insulator 14 is formed along a top portion of the trench (Figs 2-3), wherein the lip strap 52 comprises a conductor formed to extend from a top of the collar to top of the trench, the lip strap 52 further extending along a surface of the device adjacent the trench and perpendicular to the trench (Fig 4). Re claims 13 and 20, wherein a trench top oxide 54 (Fig 4) is formed such that the lip strap 52 extends into the trench top oxide and forms an inverted U-shaped structure. Re claim 14, wherein the lip strap 52 comprises a conductor formed along two perpendicular portions of a top corner of the trench (Fig 4).

Claim Rejections - 35 USC § 103

2. Claims 12, 19, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noble, Jr (6,090,660) taken with Kenney (5,710,080).

Noble teaches a method for forming a dynamic random access memory structure as applied to claims 8-11, 13-18, 20, 21-24, and 26-27 above.

Noble lacks lining the trench with a node dielectric.

However, Kenney teaches forming in the trench a combination of silicon oxide and silicon nitride for the thin node dielectric layer 26 (col 4, lines 17-27), and then filling the trench with a trench conductor 28.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Noble by lining the trench with a thin node dielectric layer comprising a combination of silicon oxide and silicon nitride as taught by Kenney, because of the desirability to facilitate the storage of a charge in a trench capacitor structure.

Response to Arguments

3. Applicant's remarks filed July 09, 2003 have been fully considered but they are in moot of the new ground(s) of rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO**

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MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael M. Trinh whose telephone number is (703) 308-2554. The examiner can normally be reached on M-F from 8:30 Am to 4:30 Pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (703) 308-4905. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Oacs



Michael Trinh
Primary Examiner